

12

② Application number: 90113570.7

Ⓟ Int. Cl.⁵: **A47C 7/74**, **B60N 2/00**

② Date of filing: 16.07.90

③ Priority: 04.08.89 IT 6767889

I-10135 Torino(IT)

④ Date of publication of application:
06.02.91 Bulletin 91/06

⑦ Inventor: Tarzia, Antonio,
Corso Torino 79
I-10064 Pinerolo(IT)

⑧ Designated Contracting States:
DE ES FR GB SE

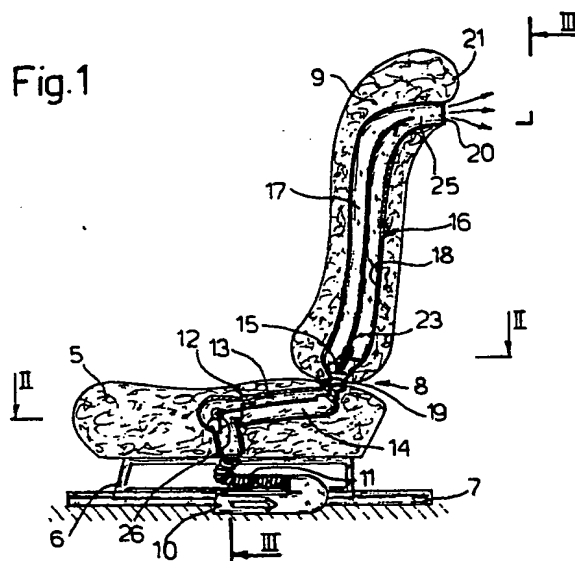
74 Representative: Jorio, Paolo et al
STUDIO TORTA Società Semplice Via Viotti 9
I-10121 Torino(IT)

⑦ Applicant: **FIAT AUTO S.p.A.**
Corso Giovanni Agnelli 200

⑤4 A seat for vehicles having an air conditioned passenger compartment.

57 The seat cushion of the seat is provided with a first chamber (12) which receives conditioned air from the air conditioning system through an inlet duct (11). A further chamber (16) disposed in the seat back (9) is connected to the chamber (12) through a bellows coupling (19), and is connected to

an outlet (20) for directing air towards the rear passenger. Each chamber (12, 15) includes a cavity (13, 17) for heat exchange with the body of the front passenger, and means for adjusting the rate of flow of air.



EP 0 411 375 A1

Xerox Copy Centre

BEST AVAILABLE COPY

A SEAT FOR VEHICLES HAVING AN AIR CONDITIONED PASSENGER COMPARTMENT

The present invention relates to a seat for vehicles having an air conditioned passenger compartment, in particular for motor vehicles.

The air conditioning system of known motor vehicles, even if optimised from the point of view of the regulation of the temperature and the distribution of air, does not succeed in eliminating the local discomfort that the passenger encounters at the points of contact between his body and the seat. Moreover the passenger in the rear seat is always in less favourable conditions than those of the front passenger because of the distribution of air, even in cases in which the air is delivered into the rear part of the passenger compartment, for example through a channel in the tunnel, or in which the treated-air delivery outlets are disposed in the rear doors, for example for de-misting the associated windows. In fact, the air leaving the outlets does not flow over the rear passenger with the same efficacy as that from the various outlets for the front passenger.

The technical problem of the invention consists in creating a seat in which temperature regulation of its surfaces is effected automatically, and which allows the delivery of the conditioned air towards the rear passenger.

This technical problem is resolved by the motor vehicle seat according to the invention, which comprises a seat cushion provided with a structure fixed movably on the vehicle frame and a pivotable seat back adapted to be fixed in an adjustable angular position on the said seat cushion, and which is characterised by the fact that in the said seat cushion and/or in the said seat back there is formed a chamber connected to the vehicle air conditioning system by means of an inlet duct such as to cause conditioned air from the said system to circulate in it, the said chamber having a form such as to allow heat exchange between the said air and the body of the passenger seated on the seat.

The characteristics of the invention will become more clearly apparent from the following description of two variants of a preferred embodiment given by way of non-limitative example, and from the attached drawings, in which:-

Figure 1 is a schematic longitudinal section through a motor vehicle front seat according to the invention;

Figure 2 is a section taken on the line II-II of Figure 1;

Figure 3 is a section taken on the line III-III of Figure 1 illustrating a first variant of the seat; and

Figure 4 is a section similar to that of Figure 3, according to a further variant of the seat.

With reference to Figures 1 and 2, the seat comprises a seat cushion 5 fixed to a metal support structure 6. This structure is mounted on two longitudinal guides 7 disposed on the frame or body of the motor vehicle. The structure 6 can be fixed on the guides 7 in a known way in an adjustable longitudinal position. The seat further includes a articulated connection 8 for connecting the seat cushion 5 to a pivoted seat back 9, which can be fixed in a known way in an adjustable angular position with respect to the seat cushion 5.

The seat is suitable for a motor vehicle provided with an air conditioning system for conditioning air to be introduced into the passenger compartment. This system is adapted to regulate both the temperature and the humidity of the conditioned air selectively acting to heat or cool it. The system comprises a series of ducts for delivering the conditioned air to a set of outlets on the dashboard and possibly on the door windows.

According to the invention the air conditioning system further includes a duct 10 disposed in correspondence with each front seat to provide for conditioning of the seat itself. For this purpose the seat is provided with an inlet duct constituted by a bellows-type tube 11 which is connected to the duct 10 to allow the circulation of air in any longitudinal position of the structure 6 of the seat itself.

The seat cushion 5 is provided internally with a chamber 12 which is split into a wide cavity 13 (Figure 2) and a bypass duct 14 both in communication with the tube 11. The cavity 13 has a section very much greater than that of the duct 14 and is shaped in such a way as to present a wide upper surface to allow an effective heat exchange between the air circulating within its interior and the body of the passenger seated on the seat itself. The duct 14 is disposed longitudinally along the seat cushion 5 and carries air received from the tube 11 directly to an outlet duct section 15 disposed in correspondence with the articulated connection 8, which is also in communication with the cavity 13. Therefore the air which traverses the duct 14 does not participate in the conditioning of the seat.

The seat back 9 is provided within its interior with a second chamber 16 split into a wide cavity 17 (Figures 3 and 4) and a bypass duct 18, both in communication with the duct 15. This duct therefore allows air leaving the chamber 12 to enter the chamber 16. To maintain communication between the two chambers 12 and 16 in any angular position of the seat back 9 the duct 15 includes a portion 19 constituting a bellows coupling of the duct 15 itself.

The cavity 17 also has a very much greater section than that of the duct 18 and is shaped in such a way as to present a wide surface for heat exchange with the passenger's shoulders. The duct 18 is disposed vertically along the seat back 9 and carries the air directly to an outlet section 25 (Figure 1) adjacent an outlet opening 20 so that the air in the duct 18 does not participate in conditioning the seat back 9. The section 25 is also in communication with the cavity 17, whilst the outlet 20 is disposed slightly beneath a padded edge 21 of the seat back 9 in such a way as to direct the air leaving it towards the body of the rear passenger.

Because of the wide section of the cavities 13 and 17 with respect to the section of the associated ducts 14 and 18, the air circulates within these cavities at a reduced velocity thereby increasing the comfort of the passenger.

The introduction of the conditioned air into the chamber 12 of the seat cushion 5 can be regulated by means of a deflector 26 disposed on the inlet duct 11 and movable by means of a handle 22 (Figure 2) disposed on one side of the structure 7. Furthermore, on the duct 15, close to or downstream of the coupling 19, there is disposed an air deflector 23 (Figures 3 and 4) by means of which the rate of flow of air towards the outlet 20 and the relative mixture between the air of the cavity 13 and that of the duct 14 can be regulated.

According to the variant of Figure 4 a further air deflector 24 is disposed in the inlet section 25 of the opening 20, by means of which the vertical and lateral direction of the air flow can also be adjusted as well as the rate of flow of exiting air and the relative mixing between that of the cavity 17 and that of the duct 18. A further deflector can be inserted in the duct 15, at the outlet from the chamber 12.

It is intended that the seat described can have various modifications and improvements introduced thereto without departing from the ambit of the invention. For example the seat can be provided with two or more outlet openings disposed in suitable positions. Moreover the seat can be adapted for other types of passenger transport vehicles such as buses, aeroplanes etc.

Claims

1. A seat for vehicles having an air conditioned passenger compartment, comprising a seat cushion provided with a structure fixed movably to a vehicle frame, and an articulated seat back adapted to be fixed in an adjustable angular position on the said seat cushion, characterised by the fact that in the said cushion (5) and/or in the said seat back (9) there is formed a chamber (12, 16) connected to

the air conditioning system of the vehicle by means of an inlet duct (11) such as to cause air conditioned by the said system to circulate therein, the said chamber having a form such as to allow a heat exchange between the said air and the body of the passenger seated on the seat.

2. A seat according to Claim 1, in which the said structure is adapted to be fixed in a longitudinally adjustable position on guide means disposed on the said frame, characterised by the fact that the said inlet duct is constituted by a bellows-type tube (11) adapted to allow circulation of conditioned air in any longitudinal position of the said structure (6).

3. A seat according to Claim 1 or Claim 2, characterised by the fact that the said seat cushion (5) and the said seat back (9) are provided with two chambers (12 and 16) connected together by a bellows-type coupling (19) disposed in the articulated connection (8) between the said seat cushion and the said seat back.

4. A seat according to Claim 3, characterised by the fact that the chamber (16) in the said seat back (9) communicates with an outlet (20) disposed on the said seat back in a position such as to convey at least part of the air received from the said inlet duct (11) towards the rear passenger.

5. A seat according to Claim 4, characterised by the fact that each of the said chambers (12, 16) comprises a cavity (13, 17) adapted to allow a low speed circulation of the received air, the said cavity being shaped in such a way as to present a wide heat exchange surface towards the said body of the passenger, each of the said chambers further including a corresponding bypass duct (14, 18) for delivering at least part of the said received air directly towards the said outlet (20) without participating in the conditioning of the seat.

6. A seat according to Claim 5, characterised by the fact that each of the said cavities (13, 17) and associated bypass ducts (14, 18) are connected to a common outlet section (15, 25) from the chamber (12, 16), the outlet section (25) from the chamber (16) of the said seat back (9) being in communication with the said outlet (20).

7. A seat according to Claim 6, characterised by the fact that it includes a regulator (26) for adjusting the rate of flow of conditioned air in the said inlet duct (11), and/or manual adjustment means (23, 24) for adjusting the rate of flow of conditioned air towards the said outlet (20).

8. A seat according to Claim 7, characterised by the fact that the said adjustment means comprise an air deflector (23) disposed in the outlet section (15) of the chamber (12) of the said seat cushion (5), and/or an air deflector (24) disposed in the outlet section (25) of the chamber (16) of the said seat back (9).

Fig.1

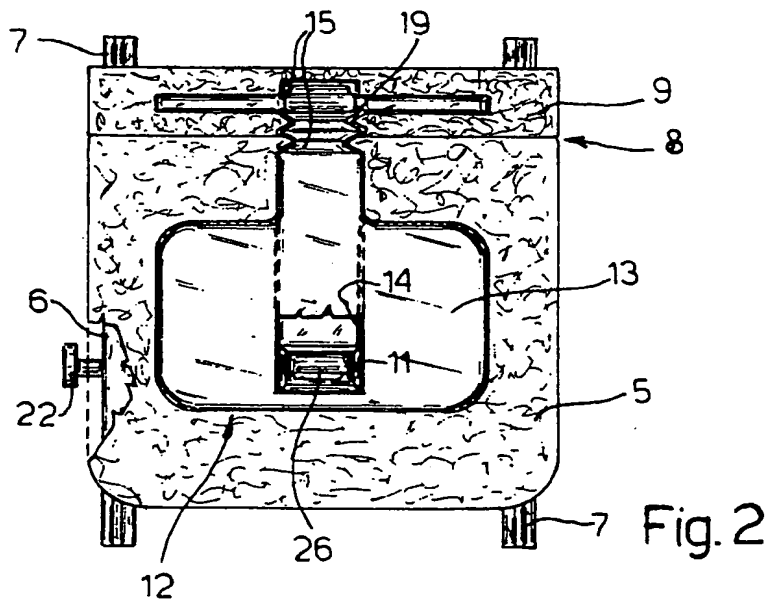
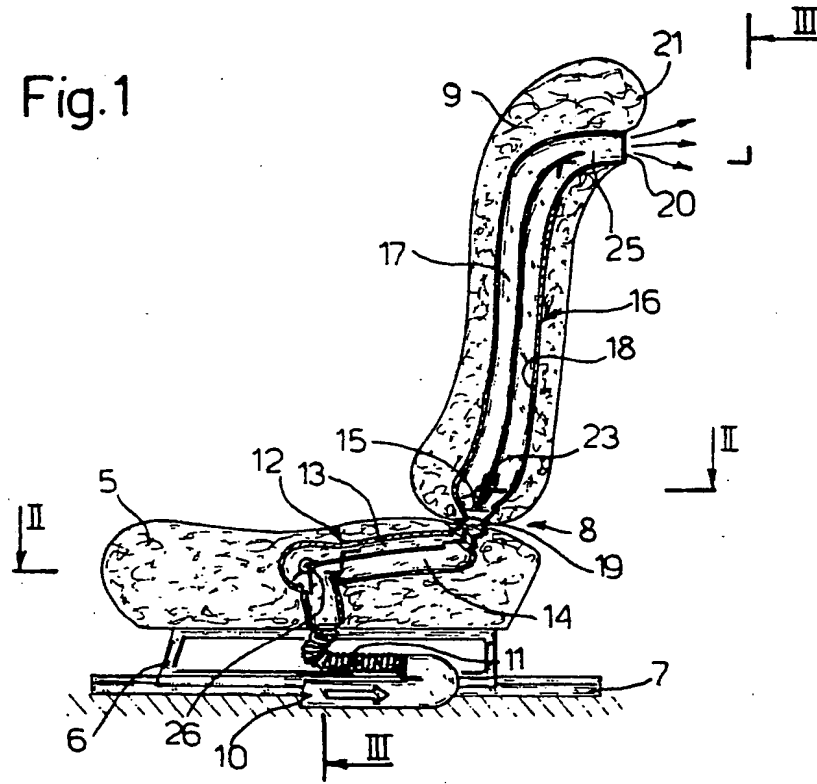


Fig. 2

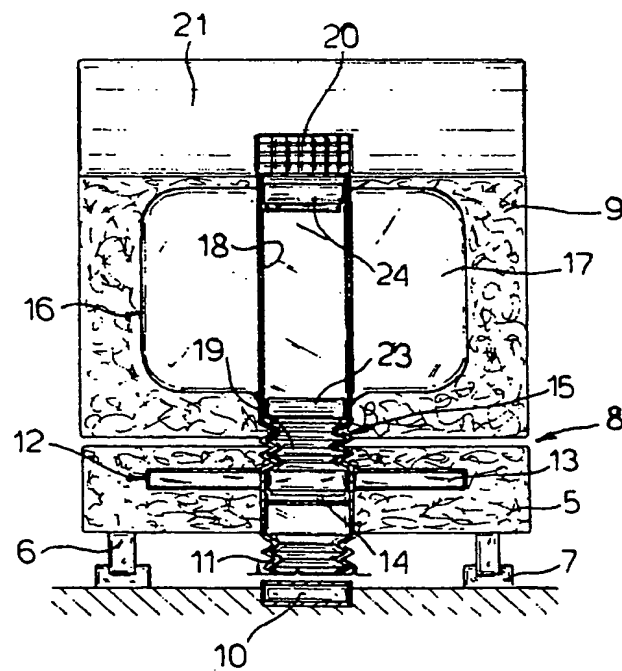
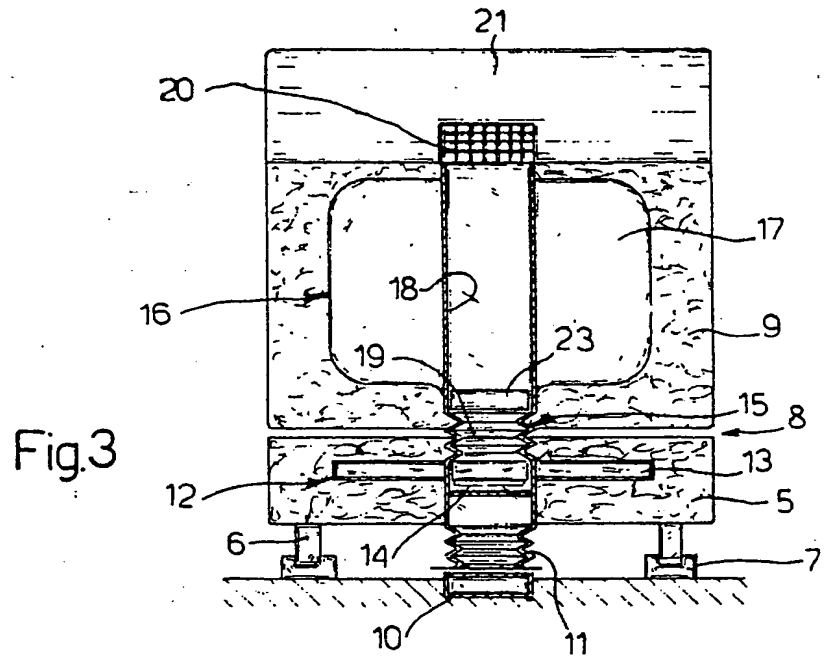


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 11 3570

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. CL.5)
A	DE-A-2039121 (DIEHL) * page 2, line 1 - page 2, line 34; figure any *	1, 2, 4	A47C7/74 B60N2/00
A	DE-A-2259628 (MASCHINENFABRIK) * page 6, line 13 - page 7, line 4; figures 1-3 *	1, 4	
A	US-A-4563387 (TAKAGI) * column 6, line 47 - column 6, line 68; figures 1-6b *	1, 2	
A	US-A-2992604 (TROTMAN) * column 15, line 58 - column 16, line 2; figures 1-13 *	1, 4	
A, P	US-A-4853992 (KAUNG) * column 2, line 24 - column 3, line 14; figures 1-10 *	1, 2, 3, 4	
			TECHNICAL FIELDS SEARCHED (Int. CL.5)
			B60N A47C B60H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 SEPTEMBER 1990	Examiner HORVATH R.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons * : member of the same patent family, corresponding document	

EPF FORM 120 (Rev. 1/90)

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☒ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☒ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.